

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY**

MONDIS TECHNOLOGY LTD.,

Plaintiff,

v.

LG ELECTRONICS, INC. and
LG ELECTRONICS U.S.A., INC.,

Defendants.

Civil Case No.: 2:15-cv-04431 (SRC) (CLW)

Electronically Filed

**DECLARATION OF JOSEPH D. LAMM IN SUPPORT OF PLAINTIFF MONDIS
TECHNOLOGY LTD.'S BRIEF IN OPPOSITION TO DEFENDANTS' MOTION FOR
SUMMARY JUDGMENT FOR LACK OF WRITTEN DESCRIPTION**

I, Joseph D. Lamm, declare as follows:

Scope of Opinion

1. I have been asked my opinion as to whether the limitation of claim 14 of U.S. Patent No. 7,475,180 ("the '180 patent") (Ex. 14¹) that recites: "a memory in which at least display unit information is stored, said display unit information including an identification number for identifying at least a type of said display unit" is supported by the specification. More particularly, I understand that there is a dispute as to whether or not an identification number for identifying at least a *type of said display unit* has written description support.

Legal Standards

2. I am informed that section 112 of the patent statute states that "the specification shall contain a written description of the invention" I further understand that the test for

¹ References to "Ex. __" or "Exhibit __" are to exhibits to the attached Declaration of Brian M. Goldberg, dated August 23, 2017 ("Goldberg Decl.").

compliance with the written description requirement is whether there is sufficient information in the original disclosure to show that the inventor possessed the invention at the time of the original filing. I am informed that in accordance with this test, the written description must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed. This requires an objective inquiry into the four corners of the specification from the perspective of one of ordinary skill in the art. I further understand that there may be written description support even if the specification does not recite the claim elements in the same way as they are stated in the claims. I have applied the foregoing principles in forming my opinion.

Qualifications & Background

3. I received a Bachelor's of Science degree in Electrical Engineering from Texas A&M University in 1977.

4. Since 2005 I have been performing consulting work in the areas of video and computer graphics. In this capacity, I have created hardware and software for a heads-up display for F-16 and B-1 aircraft simulators, performed Critical Design Reviews for video over fiber systems, developed hardware and software for an ultra-high resolution lossless Digital Video Recorder, and performed infringement and validity analyses for patents relating to displays and televisions.

5. Between approximately 2009 and 2016, my consulting work has also involved the disassembly and testing of over 200 computer monitors and televisions. My testing related directly to the '180 patent in that I identified the data contents of memories in computer monitors and televisions, and I tested to see if the data contents of the memories could be read by an external computer over an interface.

6. Between 1987-2004, I was employed by Tech Source, Inc. During the 1987 to 1992 timeframe, I was responsible for developing VME-bus graphics controllers for communicating with high-resolution monitors. In the 1993-2005 timeframe, I was responsible for developing hardware and software for a line of PCI bus graphics controllers designed to communicate with displays used for medical imaging, general purpose computing, and other applications. Previous employers include FCG Engineering (1984-1987), Florida Computer Graphics (1981-1984), Basic-4 Information Systems (1980-1981) and Datapoint Corporation (1977-1980) where I designed both hardware and software for character and bit-mapped graphics displays.

7. From 2002 to 2006 I was a member of VESA (Video Electronics Standards Association), and from 2004 to 2006 served on its Board of Directors as Secretary/Treasurer. VESA develops industry standards for display interfaces so that there are standardized interfaces and protocols that enable video sources (e.g., computers) to communicate with and control connected display units. I was active on various computer-to-monitor interface standards committees, including for the Enhanced Extended Display Identification Data (E-EDID) Standard, the Display Data Channel Command Interface (DDC/CI) Standard, the Enhanced Display Data Channel (E-DDC) Standard, the Digital Packet Video Link (DPVL) Standard, the Mobile Digital Display Interface (MDDI) Standard, and the TCI/IP Packet Video (Net2Display) Standard. I also wrote and presented technical papers on VESA standards at the SID (Society for Information Display), ADEAC (Americas Display Engineering and Applications Conference) and USDC (United States Display Consortium) annual conferences.

Level of Ordinary Skill in the Art

8. Based upon my review of the specification of the '180 patent, and based upon my experience practicing and consulting in the fields of display units, display interface, and computer graphics controllers, it is my opinion that a person having an ordinary level of skill in February 1993, at the time of the filing of the original foreign priority application, would have possessed a bachelor's degree in electrical engineering plus two to four years of engineering experience with display or communications systems, or equivalent education and experience. I believe this same level of skill would have been applicable for at least a couple of years before and after 1993 as well. I myself had at least this level of skill in February 1993, and today I consider myself to be an expert in the field of displays and display communications and the subject matter of the '180 patent.

Materials Reviewed

9. In preparing this declaration I have reviewed U.S. Patent No. 7,475,180, the original prosecution history including and subsequent to U.S. application No., 08/190,848 (February 3, 1994), English translations of Japanese priority application 5-022212 (February 10, 1993), the office actions and responses in reexaminations pertaining to the '180 patent (90/013,237; 90/013,390; 90/013,481; 90/013,784) and the prior art and other materials referenced in this declaration.

Compensation

10. I have retained by Mondis Technology Ltd to form and provide my opinions. I am being compensated at an hourly rate of \$195. My compensation is not contingent on the outcome of the litigation. I was also Mondis' testifying expert in earlier patent infringement cases involving defendants Innolux, Hon Hai, and TPV.

Overview of the '180 Patent

11. The ‘180 patent claims priority to Japanese patent application 5-022212. This Japanese application was translated into English and filed as a U.S. utility application on February 3, 1994 (08/190,848). While there are a few minor differences between the original Japanese priority application and the originally-filed U.S. application none of these differences are germane to my analysis. The passages that I rely upon for my written description analysis are present in the Japanese priority application, the first U.S. application, and the issued ‘180 patent. Therefore, for simplicity, I will cite to the specification of the ‘180 patent.

12. The ‘180 patent is entitled “Display Unit with Communications Controller and Memory for Storing Identification Number for Identifying Display Unit.” The ‘180 specification sometimes uses the terms “information output system” and “information output device.” *See, e.g.*, ‘180 patent at 1:25-34. However, these terms are intended to include displays. *Id.* at 1:25-28.

13. The ‘180 patent is broadly directed at data communications between a computer and a display over an interface. Figure 1 shows computer 1 connected to display device 6. When the computer wants the display unit to show an image, it communicates red, green, and blue video signals from display controller 3 within the computer to the video circuit 11 in the display. In order to synchronize the drawing of the image on the display screen, the display controller 3 also sends vertical and horizontal synchronization signals to a deflection circuit 10 located in the display unit. The red, green, and blue video signals control the intensity of electron beams used to illuminate red, green and blue phosphors on a cathode ray tube screen 14. The horizontal and vertical sync signals are used by deflection circuit 10 to generate control signals that control electro-magnetic deflection yokes 12 and 13. ‘180 patent at 4:33-37. These yokes respond to the sync signals in order to sweep the electron beams across the screen so that

they can excite the screen phosphors and cause them to glow, which in turn causes the display to display an image.

14. In addition to communicating the video and sync signals to the display, the computer and display unit also possess a common data communications interface which is depicted by the bi-directional arrow between communication controller 5 in the computer and communication controller 8 in the display device. This data interface enables the exchange of various data and control signals between the computer and the display in order to improve the functionality of the system. The ‘180 patent describes the display device 6 as possessing a memory 9. This memory stores various information relating to the display, including: factory data, delivery adjustment data, frequency range data, and various identification numbers. *See* ‘180 patent at FIG.2, 5:15-28. More generally, the ‘180 patent teaches that the memory in the display stores all “necessary information.” *Id.* at 5:16-17. Additionally, the ‘180 patent also describes the display unit as performing internal fault monitoring and communicating error, fault and status information to the computer. *Id.* at 9:13-19, 10:35-39, 3:35-42. Because the communications interface between the display and computer is a digital interface (*see id.* at 6:10-13 mentioning RS-232C, RS-422, RS-423, SCSI, GP-IB) one of ordinary skill would understand that the fault and status information would also be digital and would be stored, at least temporarily, in the display memory for transmission to the computer at the appropriate time. The stored ID numbers enable several functionalities. These include enabling an attached computer to communicate with the display unit (*Id.* at 3:14-21), informing an attached computer that the display supports a “communication function” (*Id.* at 5:62-67), indicating that the display unit is capable of receiving control instructions for adjusting the image (*Id.* at 5:67-6:9), and identifying one specific display from among a set of displays (*Id.* at FIG. 5, 7:10-41).

Analysis and Opinion

15. In my opinion one of ordinary skill at the time of filing, February 10, 1993, upon reading the totality of the ‘180 patent’s written description and figures, clearly would have come to the conclusion that the inventors had conceived of, and were in possession of, the invention claimed in claim 14, including the idea of an identification number representing at least a type of display unit. My opinion is based on several teachings of the ‘180 patent when viewed together through the prism of the knowledge of one of ordinary skill in the art. My opinion would be the same if one of ordinary skill reviewed the ‘180 disclosure as of the filing date of the original U.S. application on February 3, 1994.

16. First, it is clear that the ‘180 specification describes a plurality of different types of display units. To one of ordinary skill at the time of invention, a display “type” referred to the technology type of the display such as whether it was based on cathode ray tube (CRT) technology or different flat panel technologies (e.g., passive matrix LCD, active matrix LCD, plasma, etc.). The term “type” was also used to refer to whether the display unit was color or monochrome (i.e. black and white). This understanding by those of ordinary skill is confirmed by prior art patent 5,262,759 (“the ‘759 patent”). *See* Ex. 15, ‘759 patent at 1:29-42 (identifying CRT, flat panel, transreflective, monochrome, and passive color as being different “types of displays). *See also* Ex. 20, U.S. Patent No. 5,752,040 at 6:44 (“display of the LCD (liquid crystal display) type ...”); Ex. 16, U.S. Patent No. 5,222,212 (“the ‘212 patent”) at 1:22-34 (referring to cathode ray tube and flat panels as “types” of display devices); Ex. 21, U.S. Patent No. 5,396,593 (“the ‘593 patent”) at 4:11-15 (“... the data display means are assumed to be CRT monitors, but they are not limited to CRT monitors. Other types of data display means such as LCD, plasma display, etc. may be employed.”); Ex. 22, U.S. Patent No. 5,136,406 at 14:21-22

(“display device of a monochrome type or a color type”). I note that the ‘759, ‘212, and ‘593 patents are cited on the face of the ‘180 patent and were considered during prosecution of the ‘180 patent.

17. The ‘180 patent specifically identifies two different types of display units. For instance, the ‘180 specification describes a “cathode-ray tube (hereinafter called a CDT (color display tube))” type of display. ‘180 patent at 4:35-36. Additionally, the ‘180 specification also describes another type of display, a liquid crystal display. *Id.* at 8:50-57, 8:65-66, 9:4-8. I note that the LCD display in this particular embodiment is a secondary display that is part of the display unit and is used to display error and fault information. *Id.* at 8:65-9:3. Nevertheless, the specification still demonstrates that the inventors contemplated different types of displays could be used to display information from a controller generating video and sync signals. The ‘180 specification also makes explicit reference to the “type of display device.” *Id.* at 1:41-42. This passage is referring to a multi-scan type display possessing a microcomputer and a memory, which was a known technology type at the time. In view of the foregoing, one of ordinary skill would have understood from the specification that the inventors were mindful of different types of display units and that the use of different display types was contemplated as being within the scope of the invention.

18. Second, it was well-understood by those of ordinary skill in the art at the time that different types of displays required different kinds of signals from the attached computer in order to display an image. For instance, the ‘212 patent explains that CRT type and flat panel type displays require different timing, sync, horizontal, and vertical signals. Ex. 16, ‘212 patent at 1:28-36. Similarly, U.S. Patent No. 6,118,413 describes CRT and LCD displays as requiring “different drive signals.” Ex. 17, ‘413 patent at 2:37-41; *see also id.* at 4:33-35 (“CRT and LCD

video displays having independent refresh rates and pixel resolutions.”). The ‘413 patent describes a system in which a CRT and LCD display are used simultaneously, wherein each has a separate controller to provide the different signals required by each type of display. *See* Figure 2 (CRT controller 224 and LCD controller 234). For instance, unlike for the CRT display the LCD type display is described as requiring frame rate modulated signals and the application of dithering techniques to the drive signals. *Id.* at 2:52-55.

19. Indeed, because different display types are compatible with different kinds of signals and protocols, one of the objectives of the prior art ‘759 patent was to identify the type of display module connected to a portable computer, so that the computer could load and use a “compatible display driver” to generate signals compatible with the attached display type. *See* Ex. 15, ‘759 patent at 5:32-34 (“The protocol for the serial communications, however, is not always the same from manufacturer to manufacturer and for different display types.”), 4:64-68 (describing different displays as using different data formats and having different signal requirements and the need to provide the display with the correct operating signals); *see also id.* at 2:13-19, 5:20-30.

20. Consistent with the foregoing understanding in the art, the ‘180 specification describes that the inventors of the ‘180 patent also understood that different display types required different signals from a computer. This is demonstrated by the embodiment illustrated in Figure 9, which depicts a cathode ray tube 14 being driven by video signals and sync signals from a “display controller” 3 in the external computer. *See* ‘180 patent at 4:20-22, 4:32-36. In contrast, there is also an LCD display 34. However, this LCD display requires a specialized “LCD controller” 33 to generate the types of signals needed by the LCD screen. *See also id.* at 8:49-9:3. The fact that this second controller is labelled “LCD controller” illustrates that it is not

a generic controller or one for use with CRT displays. Instead, it is specialized to provide compatible video and sync signals that are compatible with LCD type displays.

21. Third, to one of ordinary skill in the art at the time, the ‘180 specification demonstrates that the inventors were concerned with signal compatibility between a computer and a display unit. In other words, that there was a need to ensure that an image signal being sent by a computer could be received and properly displayed on the screen of a display unit.

22. For instance, the ‘180 specification states that “[i]n current display devices ... a wide variety of display positions and sizes on the screen and video signal frequencies to be displayed are used depending on video signals to be inputted.” ’180 patent at 1:35-38 (emphasis added). Similarly, the specification makes reference to “various video signal specifications,” which is another reference to the fact that there existed numerous different signaling formats and protocols that could be used for communication between a computer and a display. *Id.* at 4:26-28. Thus, the inventors were describing the problem in the art that there existed numerous video signal formats that could be used to convey image information from a video source (e.g., computer) to a display unit. This wide variety of possible video signals presented a compatibility problem if the set of signals that could be generated by the computer was not the same as the set of signal formats that could be properly displayed by the display unit. In such a situation, the computer might generate a signal format that could not be displayed properly (e.g., with the correct size, position on the screen, and color), or perhaps not at all, on the display unit.

23. In the specification, the inventors even mention what was then a well-known technique that attempted to solve this potential signal compatibility problem. More particularly, the specification refers to the use of a "multi-scan display.” ’180 patent at 1:39, 4:27. Those of

ordinary skill in the art understood that the term "multi-scan" referred to a technology in which signal compatibility between the display and computer is ensured by having the display determine the characteristics (e.g., frequencies, timing) of the received signal and then internally adjusting the display circuitry so that an optimal image (e.g., correct size and position) is automatically displayed. *Id.* at 1:38-40 ("Therefore, a display or a so-called multi-scan display has been used so that a display device can handle various video signals."). This understanding of "multi-scan" by those of ordinary skill at the time is confirmed by the prior art. *See, e.g.*, Ex. 23, U.S. Patent No. 4,841,289 ("By using this multi scan display monitor, incoming display data signals of different horizontal scanning frequencies can be reproduced satisfactorily."); *see also* Ex. 24, U.S. patent No. 6,008,791 ("The invention relates to an automatic adjusting apparatus of a multiscan display which can provide the optimum video display automatically in correspondence to even a signal whose display timings such as blanking period and a video display period and the like of an input video signal are different."). Thus, the specification's reference to "multi-scan" further reinforces my opinion that one of ordinary skill would have understood the inventors to have been concerned about solving signal compatibility problems between a computer and display unit.

24. Consistent with the foregoing, the '180 specification also states that "the display device obtains a most suitable screen display according to the input video signal." '180 patent at 1:64-66. Again, this passage is describing the issue of signal compatibility between the display and a video source. More particularly, this passage is stating that an objective of a display system is to be able to properly display on the screen an image conveyed by a video signal. An incompatible video signal would result in no screen image or an image that is of incorrect size, position, or color.

25. Also, as I explain above, the '180 patent depicts the use of separate display controllers for CRT and LCD type displays (FIG. 9), which also indicated to one of ordinary skill that the inventors were concerned about each type of display receiving compatible video and sync signals.

26. In view of the foregoing, it is my opinion that the '180 specification describes signal compatibility between the display and a video source as being a significant issue in the inventor's minds.

27. Fourth, those of ordinary skill at the time knew that identifying the display type indicates, at least indirectly, the display's communications capabilities (i.e., what signals it is compatible with). This is demonstrated by the prior art '759 patent. The '759 patent describes a portable computer having a main computer body that can receive display modules of different types. *See, e.g.*, Ex. 15, '759 patent at Abstract ("A portable computer is configured to accept removable modular display panels of different types that plug into a structure hinged to the body of the computer."). The computer stores a set of display drivers, wherein there is a display driver for each type of display. Each display driver "knows" the signals that its particular display type is compatible with and is configured to generate and output such compatible video and sync signals. *Id.* at 2:18-19 ("compatible display driver routine for operating the display"). Each display module includes a memory storing a unique identity code identifying the display type. *Id.* at 5:20-22 ("EEPROM 51 is programmed with a unique identity code for the specific type of module. Each type of module offered for the computer has a specific identity code."), 2:15-16 ("code stored in a memory device, such as an EEPROM, for identifying the type of display"). This type ID is sent by the display module to the computer, which permits the attached computer to load and use a correct routine (driver) that is configured to generate signals compatible with

that particular display type. *Id.* at 5:23-26 (“On initializing, the system BIOS queries the display to ascertain the module type, and loads the correct routines to operate that module.”), 2:15-19 (“code ... for identifying the type of display, which is accessed by the computer memory and matched with a compatible display driver routine for operating the display.”).

28. The prior art ‘212 patent is similar. More particularly, the ‘212 patent describes using two different types of displays – a CRT and flat panel. Ex. 16, ‘212 patent at 1:22-27. It then describes these different display types as requiring different signals. *Id.* at 1:28-36. To facilitate signal compatibility between a video graphics controller in a computer and an attached display, the computer is configured for “receiving an identification signal from the video display device, which signal indicates to the controller which of the plurality of types of video display devices is coupled to the controller.” *Id.* at 8:55-58. This identification of the display type informs the controller in the computer what the signal requirements are for the attached display. When a display of a different type is connected to the computer, the computer is responsive to the new display type ID signal it receives and will generate “alternate video information” (i.e., compatible signals) in order to drive the newly-connected display type. *Id.* at Abstract (circuit “outputs main video information when the display device is a CRT display and the alternative video information when the display device is a flat panel display”); *see also id.* at 5:3-12.

29. In view of the foregoing, those of ordinary skill understood that by communicating a display type identifier, a connected computer is given information that permits it to determine what signals are compatible with that type of display.

30. Fifth, the ‘180 specification describes using an ID number stored in a display memory to enable communications between a computer and display. For instance, in column 3 it is explained that a computer possesses a memory storing identification numbers for identifying

displays (aka “information output device”). ‘180 patent at 3:14-16. The display unit stores an ID number that is sent to the attached computer. *Id.* at 3:14-21. When the ID number is received by the computer, the computer compares it to the display ID’s stored in the computer’s memory, and when it “matches” with a number stored in the computer, the “computer communicates with the [display].” *Id.* In my opinion, this passage reflects the inventors’ concerns about signal compatibility between the computer and the display and describes using an ID number to communicate information that enables the computer to communicate (i.e., to generate compatible signals) with the display. Indeed, in my opinion one of ordinary skill, based on the other disclosures from the ‘180 specification relating to compatibility issues for different display types, would understand the communicated ID to at least represent a display type ID. Such a display type ID would convey information that would enable the computer to begin communicating with the display unit.

31. What is being described by this passage of the ‘180 specification tracks closely with the prior art Moriconi’ ‘759 patent, wherein a type ID is sent from the display to the computer so that the type ID is “matched” with an appropriate driver so that the computer can configure itself to output compatible video signals. Ex. 15, ‘759 patent at 2:15-18. One of ordinary skill would understand that each display driver in Moriconi is associated with a display type ID, and thus by matching the received type ID with type ID’s stored in the computer’s memory, the correct display driver is identified and loaded, thereby enabling the computer to communicate with the display. One of ordinary kill would understand the ‘180 specification to be describing a similar process. Hence, I believe that one of ordinary skill would have viewed the foregoing passage from the ‘180 patent as being similar to Moriconi, and that the storing and transmission of a display type ID would have been understood.

32. The '180 specification also teaches that the display ID numbers are stored in the memory, and the memory is described as storing "necessary information." '180 patent at 5:15-18. As explained above, because the '180 specification indicates that signal compatibility was a concern and objective of the inventors, and because those of ordinary skill understood that display type ID's were used to overcome this compatibility problem, those of ordinary skill would have understood that at least one of the stored ID numbers (*see* FIG. 2) would be used for identifying the type of display unit, which is "necessary information" for insuring signal compatibility with the computer when different types of displays are connected.

33. I again note that a person of ordinary skill in the art in the 1993 timeframe would have held a bachelor's degree in electrical engineering and had two to four years of experience in the areas of displays or communications systems (or equivalent). The technology at issue for the disputed limitation—"a memory in which at least display unit information is stored, said display unit information including an identification number for identifying at least a type of said display unit ..."—was straightforward to such a person of ordinary skill at the time and was of minimal complexity. Even when I was in school in the mid-1970's, electrical engineering students were taught about reading and writing data to memory chips. By 1993, it was also well known to include memories in display units and have them store display unit information. This is demonstrated by numerous prior art references, including Moriconi '759 (Ex. 15) at Fig. 4 (depicting EEPROM memory), 2:13-16 ("modular displays ... have a code stored in a memory device, such as an EEPROM"); U.S. Patent No. 5,276,458 (Ex. 25) at FIG. 1 (depicting NVM 9 in display unit), 3:7-9 ("Non-Volatile Memory (NVM) 9 for storing display information in the form of digital codes"); U.S. Patent No. 5,285,197 (Ex. 26) at Abstract, 5:33-50 (video display monitor having memory 112). Moreover, as explained above, it was also well-known in the art

to use an ID stored in the memory to represent the display type. *See, e.g.*, Ex. 15, Moriconi '759 at 2:13-16. Indeed, from a technical perspective a display type ID would be stored in memory 9 of the '180 display unit in the same manner as other information is stored. *See, e.g.*, '180 patent at FIG. 2 (memory storing ID numbers, frequency range data, adjustment data, etc.). There is nothing technically unique about storing an ID number that represents a display type as opposed to any other data that is stored in the memory. Ultimately, they are all stored as binary ones and zeros in individual memory cells of the memory chip.

34. The foregoing knowledge of those of skill in the art and the low technical complexity of storing a type ID in a memory in a display unit, reinforces my opinion that one of ordinary skill would have understood the inventors to have been in possession of the invention. Even though the specification does not expressly recite a "display type ID" or similar, the '180 specification clearly teaches storing ID numbers in a display memory and communicating them to a computer so that the computer can communicate with the display. '180 patent at 3:14-21. Further, the specification describes the memory as storing ID numbers together with all "necessary information." *Id.* at FIG. 2, 5:15-19. In my opinion, these teachings, when combined with the knowledge of those of ordinary skill, in view of the low technical complexity of storing a Type ID among the described ID numbers (see FIG. 2), would have certainly made one of ordinary skill think, upon reading the '180 specification, that one of the stored ID numbers would represent the type of display unit.

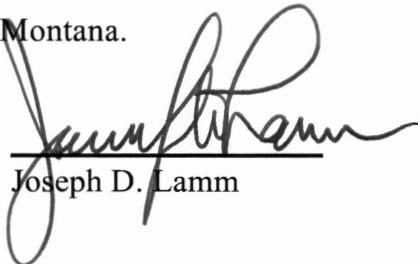
35. In sum, the '180 specification: (1) describes two different display types (CRT, LCD), (2) expressly refers to "types of displays," (3) is concerned about ensuring signal compatibility between a computer and a display, (4) describes the display ID number as enabling communication between the computer and the display, and (5) describes a memory storing

"necessary" information, including the ID numbers for the display unit. Further those of ordinary skill possessed knowledge that: (1) different display types required different video/sync signal formats, and (2) display type identifiers were used to communicate the signal capabilities of a display for purposes of ensuring signal compatibility. In my opinion, these disclosures in the '180 patent, when viewed through the prism of the knowledge of one of ordinary skill in the art, would have led to the conclusion that the inventors were in possession of the invention claimed in claim 14, including the idea of a display memory storing an ID number for identifying the type of display unit so as to provide signal compatibility for the different types of connected display units.

36. I understand that a failure of written description would render a patent claim invalid. I am also informed that the standard for invalidity requires proof by clear and convincing evidence. Based on my analysis above, it is my opinion that the written description requirement has been satisfied with respect to the disputed claim limitation and that claim 14 is not invalid.

I declare under penalty of perjury under the laws of the United States, Montana, and New Jersey that the foregoing is true and correct, is based upon my own personal knowledge, accurately reflects my opinions, and that I would testify to the same under oath at trial.

Executed August 23, 2017, in Livingston, Montana.



Joseph D. Lamm